REMARKS

Claims 1-49 are cancelled, and claims 50-69 are added herein. Accordingly, claims 50-69 are at issue.

Claims 1-17, 19-33, 35 and 38-49 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,665,089 to Dall et al. in view of U.S. Patent No. 5,591,168 to Judet et al.

The rejection, as it may apply to the claims presented herein, is respectfully traversed.

Added independent claim 50 is directed to a connector that is specifically adapted for use with a femur having a prosthetic hip implant. The implant includes a stem that extends in the femur and a ball that projects from the head end of the femur. With such prosthetic hip implants access to the implant is often necessary such as due to fractures that can occur at or near the head end of the femur. To provide access to the implant, the greater trochanter portion at the femur head end is removed, and subsequently reattached once the surgeon has completed any necessary hip replacement procedure. The connector of claim 50 is optimized for reattaching the greater trochanter to the femur and stabilizing the fracture site.

To this end, added independent claim 50 calls for a lower portion of the connector that extends along the femur below the head end and which includes a substantially rigid body having a plurality of cable openings for receiving cables extending therethrough and about the femur. The rigid lower portion body includes apertures and holding devices that are carried on the rigid lower portion body in the apertures to be advanced therein for securing the cables extending through the cable openings which secures the connector lower portion to the femur.

Claim 50 further requires an upper portion of the connector for greater trochanter reattachment to the femur upper head end. The upper portion includes a body that has a predetermined arcuate configuration to cradle the greater trochanter and at least one distal tip end configured for biting into the greater trochanter so that the arcuate upper portion body securely cradles and grips the greater trochanter. In this manner, the formation of screw

through openings in the upper portion body and use of bone screws extending through the upper portion body for securing it to the greater trochanter is avoided. Similarly, the use of such screws that may otherwise interfere with the prosthetic stem in the femur is not of concern with the connector of claim 50.

In contrast, Dall et al. only disclose cooperating ladder plates and single and multiple screw fixation means or elements which include through openings for screws. Manifestly, these ladder plates and screw fixation elements are specifically intended to employ screws for being fixed to the femur including at or toward the head end thereof. More specifically, Dall et al. show a ladder plate 36 that includes through openings 44 spaced by deformable bridges 42 through which cable holes 48 extend. After the ladder plate 36 is secured to the bone by cables 64, screws 78, 80 are utilized by way of either the single screw fixation element 38 or the multiple screw fixation element 40 which cooperate with the openings 44 in the ladder plate 36 to seat therein via complementary engaging formations. Accordingly, not only do Dall et al. focus on the use of screws, they disclose two distinct structures for their use, i.e., the ladder plate and the screw fixation elements. Even where Dall et al. teach multiple screw fixation elements that extend beyond the corresponding ladder plate, such as with respect to ladder plate 36b and the T-plate insert fixation element 90 of FIGS. 9 and 10, and ladder plate 136 and screw fixation element 140 of FIGS. 12 and 13, the screw fixation elements all are specifically adapted for use with screws.

Accordingly, it is submitted that Dall et al. do not suggest anything other than the use of screws for securing the elements 90 and 140 to the femur. This is directly opposite to the approach taken by the connector set forth in claim 50 wherein the arcuate body of the connector upper portion cradles and grips the greater trochanter rather than utilizing screws to secure it thereto. The claimed arcuate configuration avoids the need to form screw through openings and have bone screws extending therethrough that may otherwise interfere with the prosthetic stem in the femur, as set forth in claim 50. In fact, Dall et al. specifically recognize

this problem where a prosthetic implant 70 is involved. However, tellingly instead of avoiding screws with an arcuate upper portion of a connector as recited in claim 50, Dall et al. simply teach selecting shorter, unicortical screws 78 or longer, bicortical screws 80 depending on whether the implant stem 71 is present at the screw site or not (see column 4, lines 52-67 and FIG. 7 of Dall et al.). Further, the T-plate insert fixation element 90 is shown for use at the lower end of the femur, and not at the femur head end. Moreover, while the fixation element 140 is for use at or toward the upper end of the femur, Dall et al. specifically teach that a large sliding hip-screw 202 is to be used in a screw receiving formation 200 in the element 140 for stabilizing fracture 205 in the femoral head 204, as shown in FIG. 12. Not only does the screw fixation element 140 lack an arcuate configuration for securely cradling and gripping the greater trochanter as called for in claim 50, it specifically is adapted to be fixed to the femur with the large sliding hip-screw 202 which clearly would interfere with prosthetic stem in the femur. With the element 140 already utilizing several bicortical screws along its length as well as even the larger sliding hip-screw 202, there is no suggestion in Dall et al. that there may be a need for extra support along the femur, such as may be provided by the hook 4a of the element 4 of Judet et al. (which will be discussed hereinafter) particularly since Dall et al. are not concerned with reattachment of the greater trochanter at the femur head end.

Dall et al. is deficient with respect to claim 50 in other respects as well. Claim 50 calls for the body of the lower portion to be substantially rigid. By contrast, the corresponding body of the ladder plates are provided with bridges 42 that are designed to be deformed as by crimping to lock the cables in place. Dall et al. teach having the screw openings 44 sized larger than the fixation elements in the longitudinal direction to allow for distortion of the adjacent bridges 52 without interfering with the location of the fixation elements (column 4, lines 19-51). Thus, Dall et al. not only lack a rigid body for the ladder

plates they disclose, they specifically teach away from the use of a rigid body by the provision of deformable bridges 42 that are needed to secure the cables in place.

In addition, claim 50 requires a plurality of cable openings in the rigid lower portion body, a plurality of apertures in the rigid lower portion body, and a plurality of holding devices carried on the rigid lower portion body in the apertures. In contrast, Dall et al. teach cable holes 48 that are formed in each of the deformable bridges 42. With the deformable bridges 42 used for locking the cables in the holes 48, Dall et al. do not need and thus completely lack the recited apertures and holding devices of claim 50.

Judet et al. is relied upon for their teaching of element 4 that includes an upper hook 4a. However, like FIG. 12 of Dall et al., the element 4 is not adapted for use with a femur including a prosthetic hip implant as is the connector of claim 50. To this end, the element 4 is configured to cooperate with the plate 1a which has two cylindrical barrels 1c and 1d extending from the upper end thereof, as best seen in FIG. 1. These barrels are designed to receive respective large, cephalic screws 3. The screws 3 themselves are tapped to include a proximal threaded bore 3d in which additional screws 3e are received. The barrels and screws extend through a large through slot 4e formed in the element 4. In addition to the large slot 4e, the element 4 includes through holes 4f formed in the bearing face 4b for receipt of additional screws that secure the element 4 to the greater trochanter of the femur 2.

As is apparent, both Dall et al. and Judet et al. fail to disclose or suggest a connector as recited in claim 50 that includes an elongate lower portion including a rigid body that is secured to the femur by cables, and an upper portion having an arcuate body for cradling the greater trochanter and that avoids formation of screw through openings therein and use of corresponding bone screws extending therethrough to secure the arcuate upper body portion to the greater trochanter and which may otherwise interfere with a prosthetic stem in the femur. Instead, both Dall et al. and Judet et al. focus on the use of screws for fixing the various elements they disclose to the femur. Accordingly, it is submitted that claim 50, and

claims 51-58 which depend cognately therefrom, are allowable over the combination of Dall et al. and Judet et al.

Many of the dependent claims 51-58 recite additional limitations which further delineate over the relied upon references. For instance, claim 55 depends from claim 50 and calls for a driver opening that is generally aligned with and opposite the distal tip end of the arcuate upper portion body to allow a driver tool to engage therewith for driving the tip end into the greater trochanter from a remote position relative thereto. The recited driver opening enables the upper portion body to be more easily and precisely manipulated and to do so from a position that is remote from the surgical site. While driver tools and openings therefor are known structures, that in no way suggests the driver tool opening in an arcuate upper portion body of a connector as recited in claim 50. To this end, there is nothing in the relied upon art that suggests the positioning of the driver opening in general alignment with an opposite distal tip end of the arcuate upper portion body as called for in claim 50. Accordingly, it is submitted that claim 55 is allowable over the relied upon art for these additional reasons.

Added independent claim 59 is directed to a connector for attaching a greater trochanter to a femur and calls for an elongate lower portion for extending along the femur and an arcuate upper portion configured for cradling the greater trochanter. Screw openings are provided in the elongate lower portion for fastening it along the femur. The arcuate upper portion has cable retaining structure for receiving a cable extending therealong and about the greater trochanter and femur for securing the arcuate upper portion thereto. None of the cited art, either alone or in combination, suggests the connector of claim 59, and particularly the arcuate upper portion including the cable retaining structure for receiving a cable that extends about the greater trochanter and femur for securing the arcuate upper portion thereto.

As previously discussed, Dall et al. fail to disclose or suggest an arcuate upper portion configured for cradling the greater trochanter. In FIG. 12 of Dall et al., the screw fixation element 140 that extends beyond the ladder plate 136 up toward the upper end of the femur

relies exclusively on the large, hip-screw 202 for fixing the fracture 205 in the femoral head 204. As is apparent, since the goal of Dall et al. is not to secure the greater trochanter to the femur, they do not provide the arcuate upper portion for cradling the same. Instead, Dall et al. intend to use the hip-screw 202 to secure the upper end of the screw fixation element 140 to the femur, with the large screw 202 extending across the fracture 205 in particular. As such, there is no need to cradle the greater trochanter according to the teachings of Dall et al.

The teachings of Judet et al. also lack any suggestion regarding the provision of cable retaining structure on the hook 4a of the element 4. Instead, the hook 4a is secured to the greater trochanter by the use of bone screws extending through holes 4f in the bearing face 4b and the only means for securing the connected hook 4a and greater trochanter to the femur 2 is via the connection between the element 4 at plate portion 4d thereof and the plate 1a of the Judet et al. device at a position spaced from and below the screw connection to the greater trochanter. Accordingly, Judet et al. fail to teach the recited cable retaining structure of the arcuate upper portion that receives the cable extending therealong and about the greater trochanter and femur for securing the arcuate upper portion thereto. With the cable extending about the arcuate upper portion and both the greater trochanter and femur, the connector of claim 59 provides the reattached trochanter with much greater stability than is provided by the structure taught by Judet et al. Accordingly, it is believed that claim 59, and claim 60-64 which depend cognately therefrom, are allowable over the combination of Dall et al. and Judet et al.

Many of the dependent claim 60-64 recite additional limitations which further delineate over the relied upon art. For instance, claim 60 states that the arcuate upper portion is narrower in the width dimension than the elongate lower portion to minimize bending of the cable as the cable exits the retaining structure for extending about the femur and greater trochanter. Claim 61 depends from claim 60 and characterizes the cable retaining structure as

a cable opening. The narrow arcuate upper portion includes an aperture and a cable holding device carried in the aperture for being advanced therein to secure the cable in the cable opening. As neither Dall et al. or Judet et al. disclose or suggest an arcuate upper portion that includes cable retaining structure, neither reference considers the problem of undue cable bending due to the width thereof. Accordingly, neither reference discloses or suggests a narrower arcuate upper portion that minimizes bending of the cable as the cable exits retaining structure of the arcuate upper portion for extending about the femur and greater trochanter as set forth in claim 60. Further, neither reference discloses or suggests the recited cable opening, aperture and cable holding device carried in the aperture all associated with the narrow arcuate upper portion as called for in claim 61. It is submitted that there is nothing obvious about the component details for the cable retaining structure recited in claim 61, especially with respect to their location on a narrow arcuate upper portion of the claimed connector. Accordingly, it is submitted that claims 60 and 61 are allowable over the relied upon art for these additional reasons.

Added independent claim 65 is directed to a connector for reattaching a greater trochanter to a femur that includes an arcuate member for cradling the greater trochanter and an elongate member for extending along the femur. An adjustable connection is provided between the members at adjacent mating ends thereof to allow them to be secured in different predetermined positions relative to each other. Further, there are portions of the ends of the members that are configured to be in interference with each other in a direction extending away from and transverse to the femur with the members secured together at the ends by the adjustable connection. It is submitted that none of the cited art, either alone or in combination, suggests the connector of claim 65, and in particular the adjustable connection between the ends of the recited arcuate and elongate members with portions of the ends of the members configured to an interference in a direction extending away from and transverse to the femur.

Dall et al. only disclose interengaging formations on the ladder plates and screw fixation means, and these do not limit any shifting of these components away from the femur. Instead of being in interference with each other as set forth in claim 65, they are mated together when moved in a transverse direction to the femur and thus also allow the screw fixation means to be shifted in this direction away from and transverse to the femur. Accordingly, the ladder plates and screw fixation means of Dall et al. rely exclusively on the strength of the screw connection to securely hold these components together in the transverse direction to the femur. Judet et al. teach a bone plate 1a that is contoured at its upper part 1g to match the curvature of the femur (col. 2, lines 5-8). The plate 1a is connected to the element 4 so that the upper part 1g is spaced from the lower end or plate portion 4d of the element 4, as can be seen in FIG. 5. This requires that the element 4 be provided with a relatively large slot 4e. As shown, this slot 4e extends for approximately half the length of the element 4 so as to be able to receive the contoured upper part 1g in clearance between the elongate side branches 4e on either side of the large slot 4e. As such, the required large size of slot 4e can compromise the strength of element 4. Thus, the apparatus taught by Judet et al. lacks the mating ends at which an adjustable connection is provided, and further lacks the recited interfering portions of the ends of the members as required by claim 65. Instead, Judet et al. teach a connection at an intermediate position along the length of the plate 1a necessitating the undesirable large slotted structure in the element 4. Accordingly, it is submitted that claim 65, and claims 66-69 which depend cognately therefrom, are allowable the relied upon references.

Based on the foregoing, consideration and allowance of added claims 50-69 are respectfully requested.

Respectfully submitted,

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